

## Sandwich Harbor Subwatershed

### Sandwich, Cape Cod, Massachusetts

The Sandwich Harbor Subwatershed has an area of 6,580 acres. Old Dock and Old Harbor Creeks flow into Sandwich Harbor, which opens to Cape Cod Bay. Routes 6 and 6A run northwest to southeast through this watershed. The area hosts Shawme-Crowell State Forest, Green Briar Nature Center, and the Massachusetts State Fish Hatchery. Sandwich has a municipal water supply, though parts of East and South Sandwich are not part of the water district. There are no municipal sewers in the town.

The water bodies that have received the most study in this area are the Shawme Ponds. Concern over the sediment on the bottom and the mats of weeds that grow on top inspired local citizens to form the Shawme Ponds Watershed Association in 1998 to monitor the ponds. A 1998 study found excessive levels of nitrogen and phosphorus in Upper and Lower Shawme Ponds. These nutrients contributed to excessive weed growth in the pond. It is believed that phosphorus is the primary nutrient affecting the system. A 1999 study by the Massachusetts Department of Environmental Protection found that nearly 100% of Lower Shawme Pond was covered with dense algal mats and free floating plants. Algae was also abundant in Upper Shawme Pond and most of the bottom of the pond was covered in dense plant growth. Groundwater is the primary source of water to these ponds.

In a 2001 study, researchers studied the quality and quantity of groundwater entering Upper and Lower Shawme Ponds. Based on an understanding of the Shawme Ponds system and the nature of the nutrient moving through the soils, the researchers believe that the primary sources of phosphorus and nitrogen to the Shawme Ponds are located in the immediate vicinity of the ponds. Likely sources include inadequate or poorly maintained septic systems, excessive pet and wildlife waste, and improper lawn management. The study found that in both Upper and Lower Shawme Ponds, the observed phosphorus levels have the potential to result in poor in-pond water quality and advanced levels of eutrophication. The data on nitrate-nitrogen indicated that it is not contributing to water quality problems. The observed levels of ammonium nitrogen do not currently pose a toxicity problem for Upper Shawme Pond, however, some values observed within Lower Shawme Pond may indicate the potential for some localized toxicity problems.

The Three Ponds District of Critical Planning Concern, created in 2000, is located in this watershed. The district encompasses almost 700 acres of land and more than 300 acres of surface waters, including Lawrence, Spectacle, and Triangle ponds. The town nominated the district to protect groundwater quality, surface water quality, natural resources, and wildlife habitat; to maintain the rural and scenic character and traditional camp use of the area, to review growth management tools, and to foster the permanent protection of open space and appropriate recreational facilities. Regulations are in place that encourage cluster development and increase resource protection. The town also voted to purchase a significant part of the area for conservation purposes.

Past oil, fuel, chemical, and hazardous waste disposal activities on the Massachusetts Military Reservation have created groundwater pollution plumes, one of which is projected to flow into this watershed. The Air Force Center For Environmental Excellence (AFCEE) is investigating and addressing this groundwater pollution.

### Stewards:

- Shawme Ponds Watershed Association

### Studies conducted in the watershed:

- Diagnostic/Feasibility Assessment of Shawme Ponds, 1998.
- Shawme Ponds Septic Leachate Study, 2001, Sandwich, Massachusetts.
- Cape Cod Atlas of Tidally Restricted Salt Marshes. 2001. Cape Cod Commission.

### Who is collecting water quality data and where:

- Shawme Ponds Watershed Association collects data on 21 sites on the Upper and Lower Shawme Ponds (since 1999). Samples are taken every two weeks in the summer and once a month in the winter. The parameters recorded are air temperature, water temperature, dissolved oxygen, pH, TDS, alkalinity, total phosphorus, nitrate-nitrogen, and weather, rainfall, and winds.

### Management actions taken:

- Beach Nourishment at Town of Sandwich Beaches, Stabilization of Sandwich Harbor Inlet, and Maintenance Dredging at the East End of the Cape Cod Canal (MEPA document, estimated completion Winter 2000).
- Beach nourishment and inlet stabilization at Sandwich Town Beaches and Maintenance Dredging East End of Cape Cod Canal. Notice of Project Change. Woods Hole Group. September 2001.
- Town Neck Drainage Area Stormwater Pollution Mitigation Project. Project goal is to address discharges that affect the Mill Creek Estuary in order to reopen recreational shellfish beds closed since 1985. Project funded through the MA Coastal Zone Management Coastal Pollution Remediation Program.
- Town prohibited internal combustion engines larger than 6 horsepower from smaller ponds in Sandwich.
- Town of Sandwich received a FY03 Coastal Pollution Remediation – 4 the Environment Grant for its Sandwich Village/Mill Creek Project. \$21,945.

### Subwatershed facts: (For data sources see the Appendix)

- 21E sites: 3, located at KWE Enterprises, Route 6A; Kiah's Way, Rte. 130/Kiahs Way; and the Massachusetts Military Reservation Transmitter
- Solid waste sites: 1
- Zone IIs located in this watershed: 2
- Interim Wellhead Protection Areas (IWPAs): 1
- Percent of the undeveloped land that is protected (according to 1985/1990 data): 15.8%
- Acres of existing wetlands: 653
- Certified vernal pools: 1
- Named freshwater ponds & lakes: Doughnut, Boiling Springs, and Ox Ponds; Shawme Lake, Upper Shawme Lake
- Named rivers or creeks: Mill, Factory, Parsonage, Ox Pasture, Pine Island, Old Dock, Old Harbor, Spring Hill
- Beach closures: Shawme Pond was closed to swimming for at least one day during the 2001 season due to high enterococcus bacteria counts
- Shellfish growing areas: Sandwich Harbor, Old Dock Creek, and Old Harbor Creek are prohibited. Recreational shellfish beds have been closed in the Mill Creek Estuary since 1985.
- This watershed contains Natural Heritage and Endangered Species Program (NHESP) Estimated Habitats of Rare Wildlife.

### Priorities:

- Initiate water quality monitoring program in Sandwich Harbor for nutrients and bacteria to participate in the Estuaries Project, Southeastern Massachusetts Embayment Restoration. Work with Estuaries Project to develop a QAPP.
- Implement those salt marsh restoration projects identified in the 2001 *Cape Cod Atlas of Tidally Restricted Salt Marshes* that have been evaluated and prioritized by the town. Sites are: Penn Central Railroad restriction of Mill Creek (Site SA-1), Route 6A restriction of Mill Creek (SA 2), Boardwalk Road restriction of channel from Dock Creek (SA-3), Dewey Avenue restriction of Dock Creek (SA-4), Penn Central Railroad restriction of Dock Creek (SA-5), Penn Central Railroad restriction of Ox Pasture Creek (SA-6), Penn Central Railroad restriction of Pine Island Creek (SA-7), and Foster Road restriction of Old Harbor Creek (SA-8).
- Reduce phosphorus inputs to Shawme Pond. Examine septic, lawn care practices, and wildlife and pet management.
- Restore dam at Shawme Pond.
- Conduct aquatic invasives monitoring on Shawme Pond. Explore options for reducing weeds, such as mechanical raking.
- Conduct sediment analysis of Shawme Pond.
- Acquire open space. Parcels considered a priority for acquisition for water supply protection and development: Sandwich Tracts 1, 4, 9, 10, 11, 12, 13, 14, 16, 17, 27, 31, and 40 were ranked as having medium or high water supply development potential in the Cape Cod Commission's *Priority Land Acquisition Assessment Project* (April 1999). These tracts are located throughout the Town of Sandwich.

### Recreation:

#### Camping areas:

- 285 sites in Shawme-Crowell State Forest

#### Golf courses:

- Sandwich Hollows Golf Club

#### Pathways and trails:

- [www.capecodcommission.org/pathways/trailguide.htm](http://www.capecodcommission.org/pathways/trailguide.htm)

#### Public access:

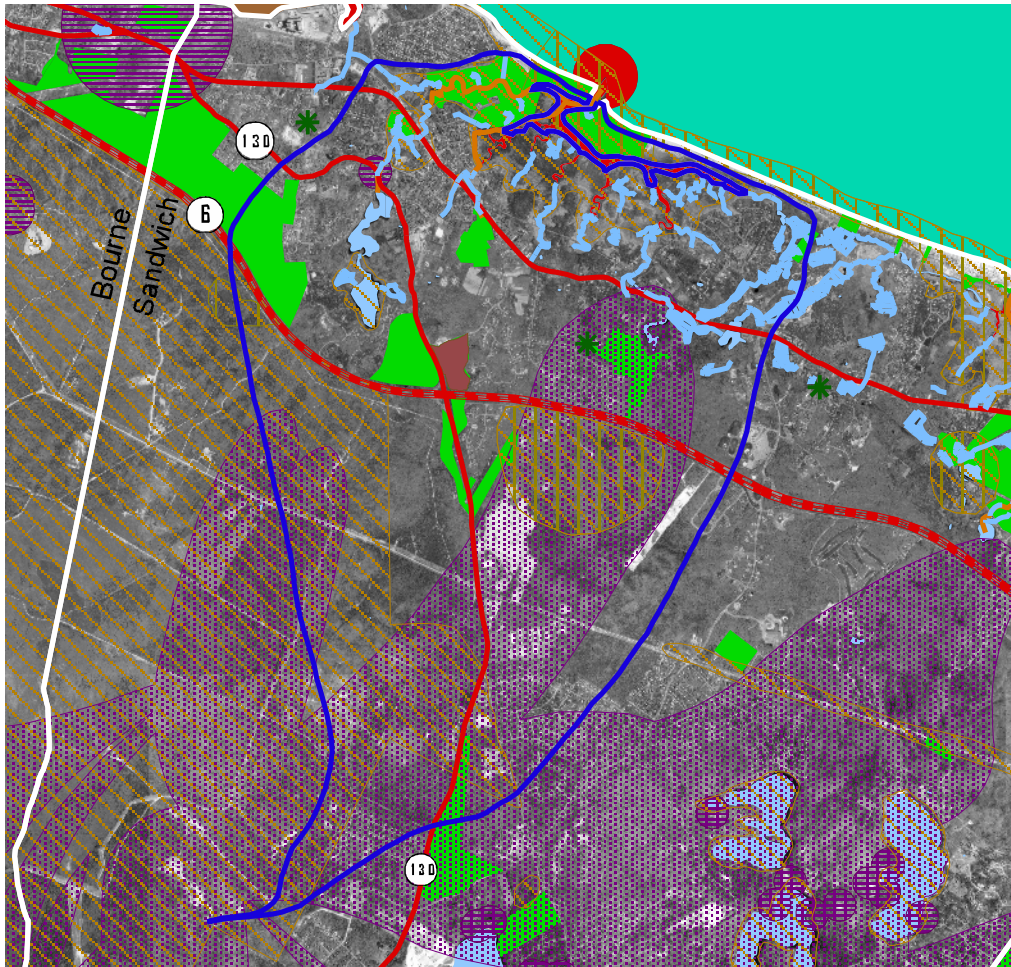
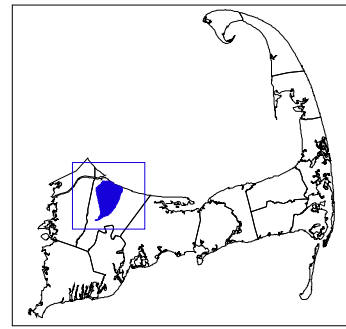
- [www.state.ma.us/dfwele/pab/pabSEmap.htm](http://www.state.ma.us/dfwele/pab/pabSEmap.htm)

#### Public beaches and landings:

- Town Neck Beach
- Landing on Old Dock Creek

# Sandwich Harbor

Sandwich, MA



## Watershed Resources



1 0 1 Miles

### Natural Heritage and Endangered Species Program Data

- Certified Vernal Pool
- Priority Habitats of Rare Species
- Estimated Habitats of Rare Species

### Groundwater Protection Areas

- Interim Wellhead Protection Area
- Zone II
- Solid Waste Facility

Watershed Boundary

Anadromous Fish Run

### Shellfish Growing Areas

- APPROVED
- CONDITIONALLY APPROVED
- MANAGEMENT CLOSURE
- PROHIBITED
- RESTRICTED

Open Space

Streams

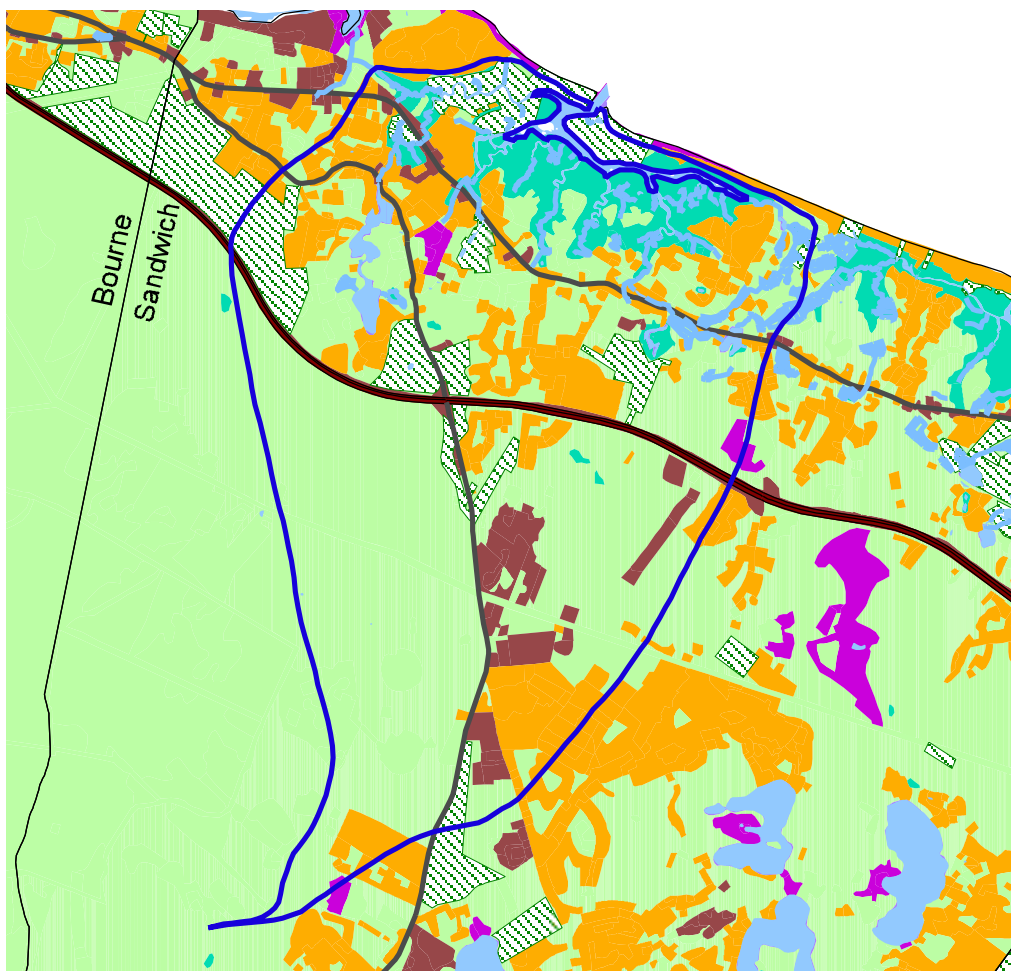
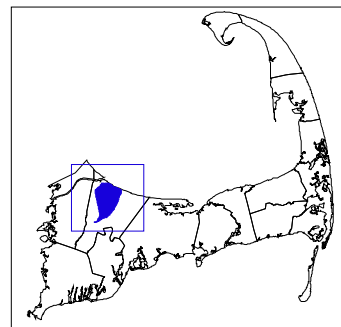
Ponds

Roads



# Sandwich Harbor

Sandwich, MA













## Land Use



1 0 1 Miles

## Land Use

- |   |                           |   |                      |
|---|---------------------------|---|----------------------|
|  | non-residential developed |  | Streams              |
|  | open land                 |  | Ponds                |
|  | recreation                |  | Watershed Boundary   |
|  | residential               |  | Protected Open Space |
|  | water                     |   |                      |
|  | wetland                   |   |                      |

